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NSF Reorganizes Applied Research Programs

Applied research is scheduled for an extensive revamping at the National Science Foundation with the decision by Director Richard C. Atkinson to scrap the Foundation's program of Research Applied to National Needs (RANN).

The National Science Board last week approved Atkinson's new applied research policy as outlined in a memo he sent the Board late in August. Atkinson has decided not to make the changes public until the key appointments are made, but copies of the memo are available on request, along with background papers assessing future directions for applied research at NSF. The studies were done by a task force headed by John Whinnery, professor of engineering at the University of California, Berkeley.

Although critics of Atkinson have said he is out to kill applied research at the Foundation, the new scheme

Applications which provides support for basic research that has high relevance to major problems. Support will be provided through increased funding for selected areas in the basic research directorates . . . NSF has a model for this division in the Energy Related General Research Office established in 1975. The division has the added complexity of having to define the problem areas as well as the related areas of basic research.

"Each area selected would be assigned a target amount of funds to supplement existing support in the basic research directorate . . . If the proposal meets the standards of the basic research program and appears to fall within one of the identified areas, it could be reviewed with the program coordinator in the Science Applications Directorate to determine suitability for funding with POBR funds . . . Thus, program officers could augment their pro-

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Director of Geological Survey

Dismissed from Post—Page 8

mainly attempts to give it more managerial rationality. The changes are in keeping with some ideas circulating around in the 1969-72 period, when Director William D. McElroy argued that applications consciousness should pervade all of NSF's activities.

That never happened. The RANN program and its staff evolved as a separate entity within the Foundation, jealous of its own autonomy but increasingly under fire from Congress, the Office of Management and Budget, some mission agencies, NSF staffers resentful of its separate status, and — probably most significantly — the social science community. It is a story richly deserving of a post mortem.

Since the Atkinson memo hasn't been given general circulation this is a detailed account of its contents. Its philosophical theme is the need to unite a research applications mentality and managerial process to the basic research activities already supported by the Foundation.

The new setup establishes a Science Applications Directorate, which, regrettably acronyms as SAD, to be headed by Jack Sanderson. It inherits RANN's \$63 million budget and, according to Sanderson, will seek other internal NSF funds to support projects not currently funded by RANN. SAD will be made up of four divisions — problem-oriented basic research (POBR), applied research (DAR), problem-focused research applications (PFRA), and Intergovernmental Science and Public Technology (ISPT). These are the descriptions:

POBR: "a matrix-managed division within Science

In Brief

There's little prospect, at least at present, of any federal research agencies being lumped together as part of the Carter Administration's reorganization drive, according to sources at the Office of Science and Technology Policy. Under study are a slew of R&D "issues," such as support of academic research and natural-catastrophe mitigation, but major organizational changes are still a long way off.

The "issues" study is being handled by OSTP Director Frank Press, with the assistance of a staff member, Phil Smith, and an outside consultant, Clifford Berg, who was formerly with the old Bureau of the Budget.

The National Science Foundation, however, is a bit anxious about suggestions that it be folded into a proposed Department of Education. Last April, its top policy-making body, the National Science Board, unanimously adopted a statement urging that NSF remain an independent entity because "The process of research is an activity distinct from education, and its impact extends far beyond education."

Apart from an obvious interest in turf protection, NSF is concerned by the fact that the Office of Education, with which it might be mated, is notorious for poor administration, whereas NSF is widely regarded as one of the smoothest-running agencies in Washington. In private conversations, top NSF officials say that they are appalled at the prospect of being dumped into the proposed department.

... "Open Window, Hot Pursuit" Key Words

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grams by stimulating proposals in these defined areas."

DAR: "... work deemed too applied for the basic research programs and yet not fitting within the RANN-type programs of research applications... This division would be responsive to unsolicited proposals for dealing with specific problems defined by the investigator ('open window') as well as for rapid capitalization on basic research results ('hot pursuit')."

"Proposals for this division could be submitted directly by the investigator or could be derived from a disciplinary project in the basic research directorates. Program management would be coordinated and a proposal could be managed by a program officer in SAD or in a basic research directorate depending on the nature of the proposal and whether the investigator is already being supported by another directorate."

PFRA: "patterned after the existing RANN program but would be sharply focused on a small number of major programs at one time. Earthquake engineering is an example of such a program... The program would be organized around the problem being addressed and the disciplinary mix would be chosen to fit. Because the mix of major programs will be changing constantly, the disciplinary skills required in the division will also change. Thus, it is anticipated that some of the program officers will be on leave from the basic research directorates or other agencies or will be rotators recruited for particular skills."

ISPT: "This division of RANN would be transferred intact to the new SAD. The stated objectives of the division are to encourage integration of science and technology into the policy planning, program planning, and program execution activities in state and local governments and test and evaluate selected incentives which the Federal government may use to increase R&D investment in the private sector of the economy and to stimulate the accelerated introduction of innovative technology into commercial use..."

The key words are "open window" and "hot pursuit," for these are the core of the remodelled RANN. "This

model," says the Whinnery recommendations, "keeps a separate identity for applications activities while coupling to the three research directorates and the division of science, technology, and international affairs (STIA). Organized research areas (such as those now supported by Engineering) could have greater significance as hot pursuit situations, and RANN funding could be concentrated on a small number of major problems. A clearer view of science applications activities would be presented to the two major outside communities — industry and university."

Why NSF has decided to scrap the RANN acronym for the sake of higher visibility of applied research is mystifying, unless Atkinson and Sanderson want to end the association between RANN and its former director, Alfred Eggers, who was not a particularly popular figure in Congress and among many NSF officials.

At any rate, the future of SAD rests with its new director, Jack Sanderson, an intelligent, amiable physicist who came to the Foundation in 1971 as a staff associate in the Planning and Policy Analysis Office. He had previously been assistant director of the physics laboratory at Harvard. He currently is director of the Office of Planning and Resources Management at NSF. There is some indication he will change the acronym, SAD, to SAED — science and engineering applications — an acronym still pronounceable but less subject to exploitation by cynics.

NSF's Annual Report

Copies are available of the National Science Foundation's 26th annual report, which President Carter recently transmitted to Congress.

The report, 111 pages, reviews NSF's programs and US research activities in general, and also includes a statement by NSF Director Richard T. Atkinson warning of diminishing academic job opportunities for recently graduated scientists.

Orders, at \$3 per copy, should be sent to the Superintendent of Documents, US Government Printing Office, Washington, DC 20402. (Order by Stock No. 038-000-00313-5).

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Science, Government Under Carter: Calm Prevails

The tensions and controversies so often present in government relations with science and technology through much of the postwar period were dampened during Gerald Ford's caretaker administration and so far show no sign of returning in the regime of Jimmy Carter.

One reason, of course, is that science and government have been in partnership for so long that they more or less know how to get along without bumping into each other's peculiar sensitivities. The elders of science no longer respond to budgetary disappointments by depicting politicians as reincarnated cavemen; nor do they any longer indulge in doomsday prophecies about the fate of the American research enterprise, though, if the official statistics are to be believed, the purchasing power of American science is now back to where it was in the late 1960s. Rather than grouse, the leaders now seem reconciled to little or no fiscal growth for their profession.

On the government side of the relationship, perhaps it's just a matter of personalities, but deference toward the leaders of science was Ford's contribution to the situation, and Carter has carried on with that manner. In contrast, Lyndon Johnson, offended by academic opposition to the

Vietnam War, adopted a vengeful attitude toward the scientific community. Richard Nixon felt so distrustful toward scientists that he even abandoned many of the Rose Garden ceremonials that scientists had come to consider their due, and then he committed the ultimate offense by wiping out the White House science office — with the explanation that he didn't need a fulltime science adviser.

Also contributing to the present calm in science-government relations is the fact that it costs so much to keep our existing R&D enterprise afloat that a heavy burden rests on advocates of new ventures. The status quo now has a large constituency, and it is allied by the realization that relatively static budgets mean that innovations have to come out of somebody's hide. One result of this is that vast new enterprises, on the scale of the moon-landing project or the so-called war on cancer, automatically encounter massive skepticism and hostility, which is why there is little serious talk about them. The colonization of space is just the sort of crackpot idea that might have gotten off the ground in the romantic and affluent Kennedy

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Stanford Report Warns of Hazard in Growth of Coal Use

Lurking behind the planned use of coal as the centerpiece of the Administration's longrange energy designs are fears of the calamitous effects that might ensue from an atmospheric buildup of carbon dioxide from massive coal combustion.

Now the Stanford Research Institute (SRI) has produced a study, still in draft form, in which it has responded to a request from the Energy Research and Development Administration to provide an "envelope of uncertainty for each major aspect of the CO₂ effect, and to end up with a highest and lowest reasonable impact case from which to derive sociopolitical effects."

The SRI's "envelopes" do not carry reassuring messages. Among the high assessments are the following:

Over the next 50 years, large and persistent fluctuations in global food supply due to repeated crop failures around the world coming from climate variability caused by CO₂ buildup.

Within the same period, chronic water shortfalls below those needed to sustain energy technologies and agriculture causing disruption of the US economic system.

Within 50 to 100 years, increasingly regulated population migrations between regions and across borders due to climate related collapse of "selected webs in

regional economies."

Within the same period, shifts in power balances among nations, along with widespread concern and political dissension about prevention of atmospheric CO₂ buildup.

The bottom line of the report seems dire, asserting that "extraordinary effort" to reduce the CO₂ buildup would produce "minimal results."

It says: "If the US alone reduced its fossil fuel use by half, to 35 quads, in 2000 and remained at that level until 2040, the doubling of CO₂ levels in the atmosphere would be delayed by roughly 5 years. Such a reduction in fossil fuel use would require an incredible national commitment where no national consensus is likely. The climatic impacts of CO₂ would not become apparent until 2020, but action would be required beginning today."

"An international scenario cutting in half the projected energy growth to 1.6 per cent would require a freeze in Japanese and Western European fossil use, a 50 per cent per capita reduction in US use, and only one per cent per capita growth in the Third World. Little cooperation could be expected from the Soviets or from the Third World. If such a solution began in 2000, the projected doubling would be delayed roughly 20 years. Once again, extraordinary effort produces minimal results."

...A New-Style Administrator for Government R&D

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era. Today, however, with NASA staggering under the bills for the space shuttle, curiosity about space colonies is mainly directed at the reasoning of its advocates.

The maturation of the American research enterprise has been accompanied by some shifts in the types of administrators who are summoned to head up the government's research activities. No generalization would be valid, but the present day crew tends to be considerably less flamboyant than those who held the same jobs during the days of spectacular growth in the 1960s.

James Shannon, director of the National Institutes of Health from 1955 to 1968, was a gregarious wheeler-dealer who dealt directly with his good friends in Congress in annually getting vast budget increases for NIH — paying little attention in the process to the frugality plans of the White House or the Department of Health, Education, and Welfare. Donald Fredrickson, the present director, is a team player who works closely with HEW Secretary Joseph Califano. He couldn't get away with trying to endrun HEW or the Office of Management and Budget, nor would he try.

James Webb was more the salesman than the administrator of NASA during his 1961-68 tenure as head of that organization. His successors, including the present chief, Robert Frosch, have confined themselves to administration; in fact, it is doubtful that many members of the public could identify the head of the space agency.

Competence, colorlessness, and team play also characterizes many other research officials on the presentday Washington scene. It can be argued that the same can be said of many of their predecessors, but long observation of this passing parade of R&D officials provides the impression that the current cast is considerably more standardized. Jerome Wiesner, science adviser to President Kennedy, quickly established himself as a political operator who held a generous view of his proper jurisdiction. Bearing the reputation of being a pre-presidential confidante of Kennedy, he radiated the close-to-power aura that makes Washington pay attention. The present science adviser, Frank Press, had no connection with Carter until he was hired for the job — a couple of months after inauguration day. Press hasn't been on the job long enough for any general impression of him to have formed in Washington science-policy and political circles. But no one is accusing him of being a political sophisticate, nor is he likely to be charged with being a skilled behind-the-scenes manipulator. At this point, the handicappers have him rated as a loyal hardworker who diligently attends to the requirements of the President and his senior aides at the White House.

Meanwhile, the National Academy of Sciences, which

off and on has been a staging area for assorted scientific entrepreneurs and institutional innovators, is perhaps at the low point of its modern history in terms of influence in Washington. Academy President Philip Handler has acquired a widespread reputation for crankiness as well as intolerance with those who fail to perceive his wisdom on a broad range of matters. While it would seem that reasonable persons could disagree on the hazards of recombinant DNA research, Handler has decided that the hazards have been exaggerated and that scientists who believe in them are doing a disservice to their profession and to society. As Academy president, Handler is accorded ceremonial recognition, but when major matters involving science and technology are at stake, few politicians turn to him for advice. Furthermore, though he often speaks publicly on matters of general interest, the Washington press — with its fine-tuned sense of who matters in national affairs — rarely sees fit to report his utterances.

The same can be said, of course, of all the other science-policy figures in Washington. There are no giants, at least in terms of the ability to command attention. But, then, apart from such odd items as laetrile and saccharin, there is, and usually has been, a dearth of issues in which scientific and technological matters are important, controversial, and comprehensible to the public. Which is one reason why Washington's science-policy community rarely gets above the second rank in the capital's pecking order of importance. Instant celebrity is thrust upon the players in the Panama Canal treaty fight, for example, but few members of the public are acquainted with the names of the major figures in the controversy over legislation on recombinant DNA research.

Another major factor in the current equanimity between science and government is to be found on Capitol Hill, where the handling of research and development issues has settled into a well-staffed routine. Back in the early 1960s, when R&D budgets suddenly began to balloon, the mere spectacle of rapid growth was enough to ignite the passions of issue-seeking congressmen. Thus, L.H. Fountain (D-N.C.) got a lot of mileage out of pursuing the take-it-on-faith accounting practices that NIH adopted toward its grantees. The government's money-giving operations have long since been tightened up, at least in regard to academic recipients, and though controversies still do arise — as is now the case between HEW and Harvard's School of Public Health — they tend to be looked upon as aberrational, rather than as symptoms of extensive problems.

Senator Proxmire continues to get a good deal of publicity with his monthly Golden Fleece awards, which often are bestowed upon government research agencies.

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...The Powers Are Friendly on Capitol Hill

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However, few take him seriously on this score, not even the members of his own appropriations subcommittee, which recently thwarted his efforts to cut the budget of the National Science Foundation.

NSF remains a plump target for right wingers who see a menace in its social science programs, particularly when they show up in textbooks and other materials for school children. However, one of the major scavengers on this flank, John B. Conlan (R-Ariz.), left the House last year in an unsuccessful bid for a Senate nomination, while another, Rep. Robert E. Bauman (R-Md.), has earned himself a reputation as a petty sniper; he can be a dangerous one, but his credibility with his congressional colleagues is not high.

Meanwhile, legislation concerning NSF is in the hands of two warm supporters of the agency, Senator Edward Kennedy (D-Mass.), chairman of the subcommittee on health and scientific research, and Rep. Olin Teague (D-Texas), chairman of Science and Technology Committee. Both can be described as stern friends of NSF; they certainly don't give its administrators carte blanche, and they often prod the Foundation into activities that it would not undertake on its own initiative — such as Kennedy's insistence that NSF seek to involve the "public" in science-policy making or that it extend its activities to encompass industrial basic researchers. Kennedy and Teague, however, are basically friendly toward science, and the same can be said of one of the recent arrivals in science-policy affairs, Senator Adlai Stevenson (D-Ill.), chairman of the newly created subcommittee on science,

technology, and space.

Their attitudes are symbolized by their expressions of distress over Carter's decision to pare down the size and scope of the White House science office (SGR Vol. VII, No. 14). There is nothing much they can do about it, but implicit in their opposition to the reorganization's effects on presidential science advice is the feeling that science merits a high place in White House affairs. The presidential response, of course, is that it certainly does, and in support of this contention, administration aides point out that the Office of Science and Technology Policy survived the reorganization axe, whereas several other offices did not.

What must also be noted about the Congress is that it has equipped itself with ample staff expertise for insightfully examining any major research proposals offered by the administration. Politics may still override professional judgment, but the Congress is no longer at a disadvantage in dealing with the experts of the executive agencies. The administration's energy program, for example, has been subjected to careful analysis not only by committee staffs, but also by the Office of Technology Assessment and the General Accounting Office, both of which concluded that there are major gaps between its proposed means and its stated objectives.

Overall, the science and government relationship has become steady, routinized, and reasonably congenial. Scientists are no longer regarded as a cross between miraclemen and mischief-makers, which was the case when they first became prominent in Washington after

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OTA Sifting 217 Names in Quest for a New Director

Attention focuses this month on the successor to Emilio Q. Daddario as director of Congress's Office of Technology Assessment.

OTA's Technology Assessment Council met Sept. 12 to sift the most qualified candidates from the 217 names sent in. National Academy of Sciences President Philip Handler has nominated several, and about 30 have nominated themselves.

In a sparsely attended meeting of the OTA's Congressional Board Sept. 8 — only six of the twelve members showed up — it was decided that the Board in its meeting on Sept. 20 will pare down the list to between five and ten. Board members will personally telephone the chosen to ask whether they are still interested and will then schedule interviews. So by the 20th, providing the meeting is open, the science community will know the names of those who made it to the finals.

Acting Director Daniel V. DeSimone says he has the support of the American Bar Association and of

Jerry Wurf, head of the federal, state, and local government workers union. But questions rise as to whether the political connections will help the election of an aspirant. OTA Vice Chairman Olin E. Teague said it could work for or against a candidate — and probably against in the current climate at OTA, where Kennedy, its chairman, is bending over backwards to assure purity in the selection process.

OTA staffers, meanwhile, are feeling anxiety over staff reductions that must take place before the end of the fiscal year. Under its appropriations legislation OTA was told to cut its staff from its current 155 to 130. While the official word is that attrition from the expiration of contracts will be the reduction mechanism, the truth is that some staffers will have to go. At the same time, the new OTA leadership will have to struggle with establishing a central theme that will keep the agency on course and visible.

Who's Who in Washington R&D: National Science Board

Continuing with its occasional presentation of who's who on Washington science-policy councils, SGR here-with lists the members of the National Science Board (NSB), the 24-member presidentially appointed group that is usually described as the "policy-making body" of the National Science Foundation. Despite its frequently proclaimed intentions to become a major influence in national science-policy affairs, the Board is little-known or influential outside of NSF, with the possible exception of its periodic reports on the state of science — *Science Indicators 1972*, *Science Indicators 1974*, and *Science at the Bicentennial*. However, with its broad base in the scientific and academic community, there is no doubt that it is influential in the affairs of NSF, which covets the good regard of its scholarly constituents. Which means that if one has a gripe or suggestion for NSF, an effective entry port is through a member of the NSB. Following is the membership, less one vacancy:

Terms Expire May 10, 1978

W. Glenn Campbell, Director, Hoover Institution on War, Revolution, and Peace, Stanford University

T. Marshall Hahn, Jr., President, Georgia-Pacific Corporation, Portland, Oregon

Anna J. Harrison, William R. Kenan, Jr., Professor of Chemistry, Mount Holyoke College

William H. Meckling, Dean, the Graduate School of Management, the University of Rochester

William A. Nierenberg, Director, Scripps Institution of Oceanography, University of California at San Diego

Russell D. O'Neal, Consultant, KMS Fusion, Inc., Ann Arbor, Michigan

Joseph M. Reynolds, Boyd Professor of Physics and Vice President for Instruction and Research, Louisiana State University

Charles P. Slichter, Professor of Physics and in the Center for Advanced Study, University of Illinois at Urbana-Champaign

Terms Expire May 10, 1980

Jewel Plummer Cobb, Dean and Professor of Biology, Douglass College, Rutgers — The State University of New Jersey

Norman Hackerman, President, Rice University (chairman)
W.N. Hubbard, Jr., President, The Upjohn Company, Kalamazoo, Michigan

Saunders MacLane, Max Mason Distinguished Service Professor of Mathematics, Department of Mathematics, University of Chicago

Grover E. Murray, University Professor, Texas Tech University Complex

Donald B. Rice, Jr., President, the Rand Corporation, Santa Monica, California

L. Donald Shields, President, California State University at Fullerton

James H. Zumberge, President, Southern Methodist University.

Terms Expire May 10, 1982

Raymond L. Bisplinghoff, Vice President for Research and Development, Tyco Laboratories, Inc., Waltham, Massachusetts

Lloyd M. Cooke, Corporate Director — Community Affairs, Union Carbide Corporation, New York, New York

Herbert D. Doan, Chairman, Doan Resources Corporation, Midland, Michigan

John R. Hogness, President, University of Washington

William F. Hueg, Jr., Professor of Agronomy and Deputy Vice President and Dean, Institute of Agriculture, Forestry, and Home Economics, University of Minnesota

Marian E. Koshland, Professor of Bacteriology and Immunology, Department of Bacteriology and Immunology, University of California at Berkeley

Alexander Rich, Sedgwick Professor of Biophysics, Department of Biology, Massachusetts Institute of Technology

Ex officio

Richard C. Atkinson, Director, NSF

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World War II. The inability of science to "solve" the energy crisis has had a salutary effect on political perceptions of research. Since there are no rabbits in the hat, it is just as well that the political community realizes that fact and stops drawing erroneous lessons from the World War II atom bomb project and the moon-landing program. The failure of the well-financed National Cancer Act to produce any significant improvements in cancer survival rates has also served to bring a large measure of reality to political dealings with research. Congress hasn't soured on the cancer program, which is what many feared would happen if admirable results were not swiftly produced. What has happened, however, is that many Congressmen are now questioning the emphasis on cures and the relative inattention to environmental origins of cancer. These critics are strong advocates of cancer research. They have doubts, however, about the prevailing strategy.

Their concerns, which are shared by many researchers, reflect a constructive attitude toward the role of research in national affairs. The scientific community is now deeply rooted in Washington, its value is accepted without question, and to the extent that there are squabbles between science and government, they are more in the nature of family tiffs rather than fundamental controversies. — DSG

Economic Committee Sets R&D Impact Study

A new program of the Congressional Joint Economic Committee bears watching by those interested in the connection between science and technology on the one hand and social and economic change on the other.

The program is called Special Study of Economic Change, and its research director is Charles Sheldon, former director of the science policy division in the Congressional Research Service. Congress has appropriated \$900,000 through the end of next year to get the study started.

A staff of no more than ten is contemplated, with hearings, contracted studies, and special reports the means of contact with outside expertise. Sheldon says that Rep. Richard Bolling (D-Mo.), who sparked the formation of the study, wants a fresh look at the economic system as a whole in terms of where it is going and under what ground rules.

In some ways the studies will employ some aspects of technology assessment in bridging the areas of innovation and economics under more and more constricting energy supplies and high impact undercurrents in the field of international geopolitics and economics.

The only other staffer hired so far is Robert Wallace, a Chicago banker who during the 1960's was an assistant Treasury secretary.

These are the issues the study will examine:
Economic consequences of demographic trends
Economic impact of materials prices, availability, and shortages
Long range trends in public-sector finances
Capital formation

Research, innovation, and productivity (the concern being whether R&D is paying off as well as it did formerly)

Changing patterns of industrial organization
International money markets, trade, and investment

Economic consequences of wars, natural disasters, and other disruptions

The study's prospectus states:

"There are many (science-related) changes in the making which may have sweeping economic consequences. Before 1985, microprocessors may revolutionize some parts of industry and consumer goods, and also affect energy efficiency. Successful fusion power represents a plausible solution to the energy shortage, but may remain will-o'-the 'wisp. Solar power from space is a more straightforward engineering proposition, but probably depends on the building of a single-stage-to-orbit shuttle craft whose operating costs will be more than an order of magnitude below those of the first generation shuttle now approaching flight test. But this moves such power to the year 2000 timeframe and not 1985, and if pursued would require a heavy investment over many years to bring substantial results. Unless there are new legislative barriers, genetic engineering may have sweeping consequences by the year 2000. For example, there may be gasoline from the sap of desert bushes, with little processing required, and traditional food crops may fix their own nitrogen in the soil in place of using chemical fertilizers. Bacteria may break down many of the pollutants from industry."

OTA Studies Citizen Role

The Office of Technology Assessment is conducting studies into how lay persons and citizen groups can gain a bigger voice in technological decisionmaking.

A task force headed by Merle Lefkoff, Atlanta political scientist and consultant, is looking into various ways citizens can be brought into the decisionmaking process. OTA consultant James Sullivan of the Center for Science in the Public Interest says the group is examining two approaches in its studies: The kinds of mechanisms the government uses to get technical information to citizens, and non-governmental resources that are available to citizen groups.

Sullivan says the group will prepare a report on its work eventually, but not soon. Separate from the Lefkoff task force, which next meets Sept. 18 at OTA, is an OTA program run by Amelia Govin which seeks ways of involving citizen groups in the actual development of assessments by OTA. There had been reports that OTA

was considering the actual funding of public interest intervenors in legal issues involving technology and environment. But such funding would violate the OTA charter and isn't being considered.

NBS Lectures Published

Lectures delivered last year by eight participants in the National Bureau of Standards' Distinguished Lecture Series have been published under the title of *Science and Technology in America — An Assessment*.

The lecturers are: Edward Teller, University of California; Norman Ramsey, Harvard; William O. Baker, Bell Laboratories; Henry Eyring, University of Utah; Garrett Birkhoff, Harvard; Alan Perlis, Yale; Robert C. Seamans, former director of the Energy Research and Development Administration, and Simon Ramo, TRW.

The 166-page collection is available for \$2.50 (\$3.12 for foreign orders) from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

Interior Chief Fires Geological Survey Head

Vincent E. McKelvey gained the distinction last week of being the first director of the US Geological Survey ever to be fired in the 98-year history of that agency.

The axe was wielded by Interior Secretary Cecil Andrus, who, as long ago as last May, asked the National Academy of Sciences to perform its traditional role of recommending candidates for the directorship. The Academy delivered its list last week, and Andrus immediately announced the firing, which, inevitably, set off grumblings about the "politicization" of the Survey. The charges, however, evoked little sympathetic response, for the simple reason that there is a general realization that times have changed and that McKelvey, who is in the old tradition of Survey directors, is not a suitable head for the agency at this time.

McKelvey, who came up from the ranks in the Survey as successor to the deceased William T. Pecora in 1971, has no enemies in the geological or political community. In fact, one of his defenders prior to his ouster was White House Science Adviser Frank Press, a geologist, who, sources say, went to bat for McKelvey, but failed to succeed in winning Andrus over. Press was reportedly not consulted prior to the decision to remove McKelvey.

Interior Department spokesmen say the move was delicate to pull off for the very reason that McKelvey, 61, is a popular figure, a calm administrator, and an obviously accomplished geologist. But they point to the pro-environmental protection bias within the Department and say that McKelvey was a less than enthusiastic spokesman for the environmental cause. McKelvey's supporters say he successfully walked the thin line between resource exploitation and the conservation ethic.

McKelvey's removal marks the formal beginning of a new, politically involved era in the Survey's history. It has frequently come under criticism for its avoidance of controversy in the name of scientific purity. The energy crisis and the need at higher levels of government for quick answers to questions on petroleum and uranium data jolted the Survey out of what many observers saw as an excessively detached attitude toward urgent public issues.

Now, with a number of geologically related problems reaching higher-level decisionmaking — earthquake prediction and hazard reduction, water supply and quality, energy conservation, and uranium exploration — the Survey needs a director who is willing to involve himself in some heavy political infighting. McKelvey was not considered up to it.

Beginning in January, he returns to the scientific bench at the Survey. Andrus will not elaborate beyond his statement that "an expanded role for the Survey, including additional responsibilities for environmental protection, energy development, and mineral leasing, makes a change in leadership desirable for the years ahead." Says a spokesman: "If we went further into the reasons we'd be forced to go into what would look like a detailed indictment and that wouldn't be either fair to or true of McKelvey."

At any rate, the Academy developed its own criteria for qualities it looked for in nominating successors to McKelvey. All match those characteristics that led the Academy to recommend McKelvey to the top Survey job in 1971. The difference is that today he is no longer relevant.

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